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**EDUCATION AND TRAINING
IN INDUSTRY IN RHODESIA**

H. W. ROBERTS

UNIVERSITY COLLEGE OF
RHODESIA AND NYASALAND

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Introduction

This study follows a series of discussions, during the period March to November, 1963, with the managements and personnel departments of a number of mining and manufacturing companies in what was then Southern and Northern Rhodesia and are now Rhodesia and Zambia. The larger firms had personnel departments with comprehensive records of their labour force, and they also had training departments, or officers, engaged in programmes of basic education or vocational training or both. The smaller firms had no training departments; though they were practising some form of on-the-job training, they had no detailed records of the educational level of the African workers, and were not engaged in programmes of basic education for such workers.

As a result of these preliminary discussions there arose three problems, within the general context of the education and training of industrial workers, which appeared to be pressing on employers. These problems were:

- the low general level of education among African workers;
- the difficulty of teaching skills to such poorly educated workers; and
- the consequent limit placed on the advancement of African workers to supervisory and managerial positions.

A survey was then prepared, to obtain more detailed information on these matters. The purpose of this paper is to set out the facts obtained in the survey, to present questions of interest to employers and others concerned with the future economic development of the country, and to provide a lead to further investigation into the field of manpower development. The Institute of Adult Education proposes to continue its studies in this field.

THE SCOPE OF THE STUDY

In order to clarify the problems set out in the introduction, the survey sought to obtain information on the following points:—

The existing facilities for training and study within industry.

The aids, in the form of text books, materials, and radio or television instruction, required for education designed to improve performances.

The relationship between educational levels and the kinds of jobs performed.

The ways in which existing educational standards affect industrial relations.

The scope of the study is limited to the facts obtained in the enquiries and to a commentary upon them. It is also limited to consideration of the mining and manufacturing industries of Rhodesia, following the termination at the end of 1963 of the Federation of Rhodesia and Nyasaland.

Mining.

The preliminary enquiries had indicated that detailed personnel records and education and training programmes were limited to relatively few larger firms. In discussion with the Chamber of Mines of Rhodesia it was indicated that while there were a few large mines with education and training programmes the great majority of mines, including stone quarries and clay and sand pits, were small operations employing only a few workers and without adequate personnel records or training programmes. Thus, while it was desirable to spread the survey as widely as practicable, with the advice of the Chamber of Mines it was decided to send the questionnaire to mines employing approximately five hundred workers or more. Ten mines in the country controlled by eight companies, came within this category.

Table 1 shows the average spread of the labour force over the industry at the end of 1961.

By September, 1963, the total labour force in the whole mining industry had dropped slightly from the figures shown in Table 1, to 40,500 Africans and 2,590 non-Africans (2).

The ten mines to whom questionnaires were sent employed a total of 1,671 Europeans and 15,657 non-Europeans (3). Assuming a negligible number of non-Europeans other than Africans (which is justified from the returns) these mines, therefore, employed 64%

TABLE I. (1)
Mining Industry—Number of Establishments and Employees.
(Average for 1961).

	No. of Establish- ments	Labour			
		African		Non-African	
		Total	Ave. No. Employed	Total	Ave. No. Employed
Metal Mining	123	25,231	205	1,391	11
Non-Metal Mining	22	15,052	684	1,169	53
Stone quarrying, etc.	18	997	55	53	3
<hr/>					
Total mining and Quarrying	163	41,280	253	2,613	16

of the Europeans and 38% of the Africans in the industry. All the remaining 153 units employed an average of six Europeans and 162 Africans each. This indicates the concentration of size and labour force in a small number of large mines.

The questionnaires were completed and returned, between January and April, 1964, by eight out of the ten mines. The labour force covered was 1,490 Europeans and 14,432 non-Europeans, or 58% and 35% of the respective racial groups in the mining industry.

Manufacturing.

The wider dispersal of manufacturing over a fairly large number of types of industry and, in many of these, over a large number of firms, made a proper choice of such firms more difficult. Table II shows the spread of the total labour force over the field as a whole and within separate groups of the industrial classification. The average number employed per establishment disguises the existence in some industries of a few predominating firms. Within the classification in Table II (under Transport Equipment) are included the Rhodesia Railways workshops insofar as they do manufacturing and repair work, and the maintenance of aircraft. These two types of operation were not included in the survey, because both the Railways and Central African Airways form, in themselves, organisations each with a broader scope of operations and approach to training.

The eventual choice of firms to whom questionnaires should be sent was made after a study of a draft Directory of Commodities which was at the time being prepared by the Ministry of Trade, Industry and Development. The Industrial Directory issued by the Association of Rhodesia and Nyasaland Industries (ARNI) was also consulted. Before the questionnaire was finally distributed its form was discussed with the Director or ARNI. Besides trying to

TABLE II. (4).

	No. of Establish- ments	African		Labour		European	
		Total	Employed Ave. No.	Total	Employed Ave. No.	Total	Employed Ave. No.
Grain Milling Products	26	1,685	65	286	11	1,971	11
Baking Products	62	2,075	33	309	5	2,384	5
Other Food Manuf.	49	5,230	107	935	19	6,165	19
Alcohol, Beer and Spirits	20	1,238	62	327	16	1,565	16
Soft Drinks	16	700	44	154	10	854	10
Tobacco Manufacture, Grading and Packing	40	10,844	271	850	21	11,694	21
Spinning, Weaving and Finishing and Manuf. of Twine Rope and Cordage	21	4,879	232	321	15	5,200	15
Wearing Apparel	139	10,591	76	843	6	11,434	6
Other Textile Goods	9	522	58	64	7	586	7
Wood and Cork Manuf. other than Furniture	49	3,696	75	321	7	4,017	7
Furniture and Fixtures	80	2,718	34	406	5	3,124	5
Pulp, Paper and Products	12	1,134	94	304	25	1,438	25
Printing and Publishing	57	1,321	23	1,577	28	2,898	28
Soap, Candles, Chemicals and Chemical Prod. incl. Fertilisers Structural Clay and Glass Products	50	2,637	53	1,064	21	3,701	21
Cement and other Non-Metallic Mineral Products	36	2,019	56	140	4	2,150	4
Iron and Steel and Other Metal Basic Industries, Machinery and Electrical Machinery	38	2,515	66	530	14	3,045	14
Transport Equipment	236	10,950	46	3,119	13	14,069	13
Miscellaneous	281	7,224	26	4,805	17	12,029	17
	58	2,918	50	555	10	3,473	10
TOTAL	1,279	74,887	59	16,910	13	91,797	13

cover as many of the industrial groups as was practicable, it was the intention to cover a range of operations from the marketing and processing of local products to manufacturing and assembly industries. Though the indications were that only the large firms would be able to provide the required information, a number of smaller firms were sent questionnaires. In addition, the major oil distributing Companies were included, because they are considerable employers and, being closely integrated into large international concerns, would indicate the personnel training policies of such concerns.

On this basis ninety questionnaires were sent out. Of these, thirty-five were returned. Twenty other companies replied to the effect that they were not in a position to give the information requested. Among these latter were some, at least five, which are known to have some form of internal training programme. The thirty-five returns covered—though very thinly in some cases—the following classifications: Grain Milling; Food Manufactures; Tobacco; Wood; Pulp and Paper; Printing; Soaps and Chemicals; Iron, Steel, Metal and Machinery; Rubber Products; Transport Equipment; Oil Distribution. The firms submitting returns were among the largest in their industries.

The number of employees included in the returns is shewn in Table III. The total number of employees in Manufacturing in September, 1963, was 68,000 Africans and 15,600 non-Africans. Omitting the figures in Table III relating to oil distribution (which is not classified as manufacturing) the survey therefore covered 26% of the African workers and 25% of the non-African workers in manufacturing.

TABLE III.

	African	European	Other	Total
Grain Marketing and Milling	693	160	—	853
Food Manufactures	6,694	427	31	7,152
Tobacco	2,578	193	—	2,771
Wood	760	26	—	786
Pulp and Paper	562	85	2	649
Soaps and Chemicals	1,463	425	4	1,892
Iron and Steel, Metal and Machinery	3,346	976	7	4,329
Transport Equipment	530	310	—	840
Oil Distribution	869	639	1	1,509
Other	1,090	733	2	1,825
TOTAL	18,585	3,974	47	22,606

(1) Census of Production, 1960 and 1961. Central Statistical Office.

(2) Monthly Digest of Statistics. Central Statistical Office.

(3) Chamber of Mines figures as at 31st December, 1963.

(4) Census of Production 1960 and 1961. Central Statistical Office.

EDUCATION AMONG AFRICAN WORKERS

The demographic surveys conducted by the Central Statistical Office between 1958 and 1960 give an indication of educational levels in the urban areas of Southern Rhodesia. Table IV contains figures from these surveys and shows the educational levels of the population from which industry must obtain its labour. One reservation that must be made about the very low percentage of males over Standard 6 is that at the time of the surveys the only African Secondary Schools were outside the urban areas, and that since then two such schools have been established in the Salisbury area including Highfield African Township, and one each in Umtali and Gwelo. The percentage over Standard 6 is, therefore, now likely to be higher than shown. More primary schools have also been built in the meantime. There was, and still is, within the Umtali urban area an African Teacher Training College.

TABLE IV⁽⁵⁾

**Proportion of the African Male Population over 16
by Standard of Education attained (per cent).**

Std. of Education attained	Salisbury	Gwelo	Umtali	Wankie	N. Rhodesia (8 towns)
No schooling	51	21	45	52	47
Under Std. 1	5	8	3	8	4
Standard 1	8	13	7	11	7
Standard 2	8	14	9	10	12
Standard 3	9	15	12	7	8
Standard 4	7	14	9	5	9
Standard 5	5	7	5	3	4
Standard 6	6	7	7	3	7
Over Std. 6	1	1	3	1	2
	100	100	100	100	100

A note on the education system in Southern Rhodesia, with figures of enrolments at the various levels, is given in the Appendix to this paper.

The personnel records of some of the firms that sent in returns did not enable them to indicate educational levels. Seven of the mines and twenty-nine of the manufacturing and processing Companies that submitted returns were able to do so. Table V shews the total number of employees whose educational level was known to their employers, and the percentage of these at the main levels.

TABLE V
Educational Levels of African Workers

Number whose education level known	Mining		Manufacturing		All
		Processing Industries	Other		
....	12,452	6,043	6,646		12,689
(Percentages of above figures)					
Below Std. 1	52	41.9	24		35
Up to Std. 2	22.7	23	10		15
Up to Std. 3	17	27	22.4		25
Up to Std. 6	8	7	41		23
Up to J.C.	0.3	0.8	2.2		1.5
Up to Cambridge	—	0.3	0.4		0.5
		(21 indivi- duals)	(31 indivi- duals)		
Post Cambridge	—	—	(13 indivi- duals)		—
	100	100	100		100

Mining.

Table V gives an indication of the composition of the African labour force, by educational attainment. In the mining industry 52% of those whose level was known were barely touched by education, 82% had not passed beyond Standard 3—i.e., Lower Primary School—and only a fraction of a percentage had passed Standard 6.

Every one of the mines in the survey provided premises for at least one Lower Primary School, and in at least one case an Upper Primary School, the arrangement in many cases being that the cost of the teachers' salaries is met by Government, and that the schools themselves form part of the national education system. In addition, five of the mines provided bursaries for employees' children to go to other schools, while a sixth mine had such a proposal under consideration, and three mines provided bursaries for employees' children for higher education. All mines ran Women's Clubs and Homecraft classes for employees' wives, and all but one ran domestic science classes.

Education at an adult level for employees themselves, in formal school subjects, was provided in Company-run night schools on five of the mines. The numbers receiving instruction at the various levels in these were as follows:—

In basic English ....	....	204
Std. 1 to Std. 3 ....	....	192
Std. 4 to Std. 6 ....	....	81
Junior Certificate ....	....	1

In addition, on three of the mines a total of 31 employees were studying by correspondence in courses up to G.C.E. 'A' level (i.e., Post-Cambridge level), and on two of these mines successful students were provided with financial assistance and were given some tuition by the Company's own staff. On three mines a total of six European employees were studying by correspondence for degrees or professional qualifications at degree level.

This system whereby mining Companies have come to provide educational facilities is an extension of the provision of general welfare facilities to employees. Most of the mines in question are among the older communities in the country and are self-contained townships in terms of both the mining and industrial conciliation laws. The fact that most of them are controlled by international mining groups which began operating, in Rhodesia and elsewhere in Africa, in the colonial era may account partly for this policy of paternalism which assumes some of the functions normally undertaken by Government. It is equally likely that in later years the provision of welfare facilities has been at least desirable and probably necessary in order to attract labour. As Government schooling for African children began to develop in the larger urban centres, and as mission schooling made its increasing impact in the rural areas, the provision of such schooling by the mines became a means of attracting and retaining African labour. Initially the extension of these facilities to adult education for mine employees in lines with or in advance of such developments elsewhere was an extension of the welfare function of the employers, but discussion with mine management indicates that it is now in many cases part of an effort to raise the productivity of African workers with increasing mechanisation and a levelling-off of European immigration.

Processing Industries.

Table V shews that while the percentage of workers with an education below Standard 1 in Manufacturing as a whole was less than in Mining, it was still substantial—35 per cent. The percentage in the range between Standard 1 and Standard 3 was about the same as in Mining, but for Standard 6 and upward it was very much higher. There is an area of manufacturing where the labour pattern

approaches that of the mining industry and that is in what can be called the processing industries—those situated generally, but not entirely, in rural areas, organised as estates and employing relatively large labour forces, and engaged in processing their own production of raw materials or those of other producers. In Southern Rhodesia these firms produce commodities such as cement, timber, tea, tobacco, sugar and fruit.

Among the eleven firms which are included in this type of industry there was no minimum education level for workers, except in one small firm which had a minimum requirement of Standard 6. In these firms the education pattern of African workers was broadly similar to that in mining—41.9% below Standard 1, 92% who had not passed beyond Standard 3 and a negligible percentage who had passed beyond Standard 6. There was, however, a slight move up the scale, with a decrease in the percentage below Standard 1 and an increase around Standard 3, and the introduction of a few Africans with a Cambridge School Certificate.

Likewise in their approach to the question of responsibility for providing educational facilities for their employees and their families, some of these firms were similar to the mines. All except two which are in an urban area provided premises for at least one African Primary School. One provided bursaries for employees' children to other schools and for higher education, one provided such bursaries for other schools, and a third provided them for higher education. Seven of the firms ran Women's Clubs with home-craft or domestic science classes for employees wives. For employees themselves two of the firms ran night schools where instruction was provided in Nyanja (23 pupils), basic English (39 pupils), and school subjects at a level between Standard 1 and 3 (12 pupils). In addition, in three of the firms a total of 57 employees were studying by correspondence in courses below G.C.E. 'A' level and two at 'A' level. One firm provided financial assistance to successful students and another provided a study centre.

Manufacturing and Assembling Industries.

In the other firms, engaged in more purely manufacturing and advanced assembling, there was a noticeable change in the pattern, both of education levels themselves and of facilities provided by the firms. Eight of these firms required education above Standard 1, while four required a minimum of Standard 6 for operatives, and the extent of employment at these low levels is shewn in Table V. The marked change came at Standard 6, with a percentage

employment of 41%. 44% had reached Standard 6 or above. This indicates that though the minimum in most firms for many of the jobs was less than Standard 6, in fact there was a range of jobs for which firms sought a standard of education at this level and above. Though there was a sharp falling-off after Standard 6, a number of firms were seeking well-educated Africans, particularly for management and less senior clerical jobs.

In general the circumstances in which the firms in this category operate are different from those of the mining and processing industries. These firms are in urban areas where there exist African primary schools and a limited number of places in secondary schools. Moreover, the urban environment provides the social and other facilities which the mines and most of the processing industries provide to more isolated communities. Most of these firms are newer and smaller than the mines and large processing industries, and have moved into an established urban situation. There were only three firms in this category which provided school facilities for employees' children, and these were all outside urban areas. One firm provided bursaries for employees' children to go to school, one provided bursaries for University education, and a third provided loans for University education to selected children of employees in staff positions.

The emphasis in this type of industry begins to swing toward a greater demand for more highly educated workers, and the training of workers for their jobs on machines and, in a few cases, for supervisor and junior management positions. Only in a few firms covered by the survey was there any basic education of the workers directly by the firm. One firm, Lever Brothers (Pvt.) Ltd., in Salisbury, conducted a programme of education for African workers at the supervisor and potential supervisor level, through a system of block release supported by instruction in the Company's night school. Basic education in English and Arithmetic was being provided, in due course up to Standard 6 level, to 85 workers. Dunlop Rhodesia Ltd. was likewise providing education to 43 African charge hands at Standard 4 to Standard 6 level in preparation for supervisory work, and 17 of its workers were studying at J.C. level and 4 at Cambridge level in the Company's night school. One other firm was proposing to start its own night school in July, 1964, to teach basic Shona to employees. It is known that at least one other firm, from which returns were not received, had established classes in basic school subjects for supervisors and potential supervisors, and that some others were considering doing so.

In a number of firms employees were studying school and university subjects by correspondence at a number of levels. In ten firms a total of thirty-six employees were studying by this means at degree level, in five of them a total of twenty-seven were studying at 'A' level, and in six a total of forty-nine were studying at pre-'A' level. In most cases assistance was given by the employers. Two firms provided study centres, four provided extra tuition by their own staff and eight provided financial assistance in the form of the payment of tuition fees to successful students. One firm, Lever Brothers, provided all these types of assistance.

In brief, five out of the eight mines submitting returns, and fourteen out of the other thirty-five Companies were, directly or through assisted correspondence studies, providing educational facilities to their employees.

(5) Reports on Central Statistical Office Demographic Surveys 1958-1960.

EDUCATION RELATED TO VOCATIONAL TRAINING.

From this study there appears to be a lack of African workers at four important educational levels. These are: (a) the level at which a person can be considered literate, especially in English; (b) the lower secondary school level at which is found the potential supervisor, foreman, artisan and clerk; (c) the upper secondary school level at which is found the potential technician and junior manager; and (d) the university level at which is found the potential executive and senior manager.

Literacy and the Lower Primary School Level.

It is not possible to say precisely at what level of education a person in Southern Rhodesia becomes literate for general purposes, particularly in English and particularly in an urban setting where a sort of facility in the language may be picked up informally. Instruction in African primary schools is given in the vernacular up to Standard 3 and it is not clear how much English, or even the written vernacular, a pupil has picked up by then and may lose when he leaves school. But it is fairly safe to say that those with an education below Standard 1, and most who have reached only Standard 3, will be virtually illiterate. The proportion of such persons in mining and manufacturing industry is indicated in Table V, and the total number of Africans in such employment is about 110,000.

For the purposes of the employer, illiteracy can be taken as the level at which an inability to have communication between management and worker affects the efficiency of the worker in his job. This is probably the most immediate problem facing the employer. It is one affecting the basic function and security of the firm. Can instructions be passed to the worker about the way the job should be done, and about safety requirements? A worker who cannot read will, for instance, be unable to understand instructions on a machine, on a notice board in the shop, or at a fire control point. In some forms of economic activity and some jobs it appears that illiteracy in this sense is not a serious disadvantage to either the worker of the firm; this would appear to be borne out by the fact that mining and manufacturing industries have developed to their present size in Rhodesia, and by the fact that only relatively recently in the United States, with the increase in automation and new industrial techniques, has a relatively high incidence of illiteracy among industrial workers been revealed and given rise to new

manpower, training and development legislation. But the problem still requires employers to ask themselves, for example, what market they are producing for, and how they are to combine the available factors of production, including labour, in order to survive in that market.

They have to ask: "Do I need a cadre of literate workers capable of being trained further? Trained for what? How many? How do I select them if I do need them? How do I educate them when they are selected? Can I afford to educate them, and if not is there some sort of joint arrangement I can enter into with other employers or with the Government? Instead of trying to educate some of my present workers should I recruit a cadre of young workers who are already sufficiently educated?"

This aspect of the problem directly concerns the firm's production and the form it should take. The second kind of problem which illiteracy raises for the employer is in the field of industrial relations, where the workers are seen not merely as productive units but as men whose interactions among themselves and with management are crucial to the firm's effectiveness. Imperfect communication can minimise the workers' understanding of the function of the firm and of their part in it, and experience among African trade unionists suggests that this is a real influence in industry in Southern Rhodesia. Improvements in this field of industrial relations form a growing part of the policy of industry in the more advanced countries, and the policy finds expression in the words of Sir Peter Venables:—"We are beginning to realise that we must take account of man's nature and that firms are in reality social organisations in which men and women must work together". (6). There are in Rhodesia enough large units for this observation to have meaning in this country.

Another aspect of this problem arises from the possibility of bad relations between older workers with experience but little or no education, and younger and better educated men coming in with prospects of advancement. This problem has arisen, at a higher level, in industry in Europe, and has resulted in the development of educational and training opportunities for less educated workers within firms. (7).

These are problems arising for employers from the prevalence of illiteracy among workers. Others arise in introducing schemes for education to overcome it. The first and basic difficulty for the firm is the cost. A comment offered to the Southern Rhodesia Education Commission in 1963 (the Judges Commission) by the

Chamber of Mines was that "it is quite outside our financial resources to provide the education which is required by our employees. The provision of education by a mine is an unusual item". (8). The Commission's observations on this was: "What needs to be stressed is the mutual benefit which in each case accrues to the 'provider' of education and its recipients". This is in line with the observations made above about industrial relations. Nevertheless it is unlikely that any but the largest and most profitable firms could undertake more than a limited programme in this field, such as those being undertaken by Lever Brothers Limited and Dunlop Rhodesia, Limited.

The next problem is the shortage of suitable teaching materials. The existing textbooks are mostly directed at the education of African children over the normal school span. Experience among firms conducting education programmes in Central Africa has shown that these are not suitable for adults.

They assume such a pace of learning and contain such subject matter as to bore adults, but in the absence of anything better firms are obliged to use them. The following were recorded as being in use in classes run by various firms:—

Longmans—Day by Day Series.

Easy English.

Vernacular Readers.

Oxford—New Oxford English Series.

Oxford Readers.

Nelson—New Nation English.

All these publishers are aware of the need for basic primers and readers written specifically for adult Africans living in Central Africa and have expressed interest in receiving scripts of such books. It is relevant to mention at this point that in its research programme in Northern Rhodesia in the use of television in the teaching of basic English to adults, which is sponsored by the Copper Mining Companies and is directed at an urban working population, the Institute of Adult Education is using another Longmans series—Ship English—but this also is written for children, not adults.

There is one expert view that many of the existing textbooks are in any case not very good, even in what they were designed for, and that the best type of textbook of the elementary sort is that which could be built up by the pupils themselves in the class, using industrial illustrations. This, however, requires a high calibre of teacher versed in the technique of drawing pupils out, and such

teachers are even more scarce in Central Africa than in the more advanced countries. It is possible that programmed material designed for this level of learning can help to overcome the difficulty. In the Programmed Learning Research Centre which is being established in the Department of Education at the University College in Salisbury, and among a number of other individuals in the country, more study is now being devoted to the uses of programmed lessons, particularly as an aid to a small number of teachers, many with inadequate training, spread over a wide area and large numbers.

The possible use of other aids, especially radio and television, in the teaching of basic English and the vernaculars, has been discussed in Salisbury by a group of educationalists, broadcasters, and representatives of Rhodesia Television and the Southern Rhodesia Broadcasting Corporation. It was generally agreed that direct teaching by television, involving the production and organisation of programmes for transmission, with all the required educational aids, could be carried out only with full Government backing and through a special service. There is, therefore, no likelihood of employers being able to make use of this resource until such a service is initiated by Government. There is a greater possibility of the use of radio for teaching at this and higher levels. If such a service is to be useful to workers and is to claim the co-operation of employers it will have to be provided at times when workers will be free and which they will find conducive to study. The co-operation of employers would be required if they are to be expected to provide more study and listening centres at places of work.

A further and very general problem for employers is that of obtaining teachers for any programme to be followed during the day. Some of the larger companies can afford to employ a qualified teacher, but most cannot. For evening classes the supply is easier, since many African school-teachers are prepared to work in the evenings to supplement their normal salaries, and there is a not inconsiderable number of Europeans who are prepared to, and do, teach in African night schools.

These problems of illiteracy, while affecting immediately the employer, clearly have their implications at the national level. Regarding the provision of literacy education itself there are the problems already referred to in relation to the employer, such as the shortage of suitable materials, the proper use of other aids, and the shortage of teachers. These all become part of the larger question of how far the Government is to enter into the field as a pro-

vider or sponsor. If industry itself can undertake a limited programme of literacy teaching to serve its own direct needs, is any further effort required by Government in this direction? If industry, or individual firms cannot afford to meet even its direct needs, is there a responsibility on Government to do so in the interest of economic development? How far should Government be involved in any national literacy campaign, taking into account scarce resources and the competing needs of schooling for children? How might the help of international and other external agencies be enlisted?

But here deeper questions arise. First is the extension to the national level of the question about the appropriate combination of the available factors of production. What sort of an economy is the country likely to have with a low level of education of the majority of its workers? Given the present generally low literacy rate and the few localised company education schemes, can anything but a limited advance be made toward a technologically advanced economy? Can a less advanced economy, with a high content of unskilled labour, compete effectively in markets outside the country, or inside it without continued protection?

These economic questions rest upon ones more specifically related to education and training. Does a movement away from illiteracy and toward higher education result in less costly training? Is a better-educated worker more adaptable and therefore in need of a shorter technical training? If he is more adaptable does this mean a lower cost of retraining as production techniques change? Is a lack of education necessarily related to a lack of skill? If, as is said by some, a broader education does result in increased adaptability in training for skill, is this possibly related to the traditional skills and the traditional training methods now used to teach these skills?

This form of questioning indicates a need for closer consideration of the effect of changing technology on skills required in modern industry, and of the techniques of accelerated training developed by, for instance, Dr. Douglas Seymour, of Birmingham University, and at technical training centres in Italy. These techniques have already been tried with some success by at least one firm in Rhodesia—Philips Rhodesia, Limited. This question is referred to later in connection with vocational training.

Lower Secondary School Level.

Most of what has been said about education for literacy applies

to education at lower secondary level, for potential supervisors. Since the field is a narrower one, in that it involves fewer employees, it becomes more practicable for employers to provide active assistance. Another factor is that at this level—in fact, from Standard 4 on—teaching is provided by correspondence colleges in preparation for Government examinations in the various Standards. This is not to say that there is not room for consideration of the possibility of preparing curricula and certificates for adult study at the equivalent of the lower secondary level.

The study reveals examples of the ways in which some firms were providing help in this type of education; these are outlined in the previous Chapter on Education among African Workers. While most will be unable to conduct classes in the way Lever Brothers, Dunlop Rhodesia and one or two others are doing, the provision of study centres, some tuition, and financial assistance for correspondence education, would appear to be feasible for many more companies. The provision of study centres will be even more beneficial if correspondence education in the country becomes linked closer to the use of radio.

Upper Secondary School Level.

Table V shows the very small percentage of African workers at Cambridge and Post-Cambridge level. Twelve firms were employing one or more Africans at Cambridge level and four were employing one or more at Post-Cambridge level. One firm alone, Lever Brothers, Limited, with Unilever Services and Developments, employed seven of the Post-Cambridge men, six of these being graduates.

There are, however, signs of a growing demand for Africans with higher education. Some firms were providing assistance to employees studying by correspondence at secondary level, and at degree level. Apart from providing assistance to their own employees, which is limited by the numbers at the right level, Industry will have to rely largely on the schools, Technical Colleges and Universities to supply potential junior managers and technical personnel.

Regarding technical training of a more advanced sort than apprenticeship, there were in seven of the largest companies which made returns a total of 41 employees taking courses, either by correspondence or through the Technical Colleges, backed by practical factory work.

Technical Training.

With regard to technical training, what has been said so far gives an indication of the size of the problem of introducing any kind of training programme within industry, and of the questions to be asked before too deep a commitment is made. Without a general basis of a minimum school education there appear to be serious limits to any such programme—whether on a national or a Company basis—aimed at higher skills. But here again it is necessary to ask if it is these traditional skills at which industry is still obliged to aim or if new and developing production techniques and the markets to which industry is looking in competition with others, require a different use of manpower. This question is necessary if we are to achieve a proper relationship between education and technical training. The Judges Commission quotes the conclusions of the Joint Technical Education Committee thus: “The solution to the problem most clearly favoured by the Committee is an insistence by legal authority that industrial jobs calling for skill below craft level shall be graded in such a manner as to be available only to incomers with minimum educational standards”. (10). But the question is to discover what skills and job categories are in fact needed in the present day and for a given industrial structure, and what structure is required for an increased rate of economic growth. Is the existing economic structure related to a wage and salary structure established for reasons not entirely economic? And is the existing wage and salary structure the factor determining occupational categories within Industrial Agreements, or *vice versa*? Reference to some of the important Industrial Agreements and to the record of the negotiation of such Agreements, such as in the mining industry, indicates that wage and salary levels established in an older economic and social structure determine occupational categories and job description. Craft jobs and semi-skilled jobs tend to be defined so as to retain existing differences in wage levels. Reconsideration of such categories and skills would require reconsideration of the minimum educational standards. It might also lead to a redefinition of craft skills.

Select Committee on Apprenticeship and Technical Training.

While this survey was taking place a Parliamentary Select Committee, whose terms of reference included “the whole system of apprenticeship, technical and practical training” was investigating this field. The Committee has since tabled its First Report in Parliament. The Report, whilst restricting itself to technical training

at the skilled level, recommends that the Government give urgent consideration to "the formulation of a detailed development plan for the country as a whole which would take account of all sectors of the economic and social complex". It also recommends the establishment of an Apprenticeship Training and Skilled Manpower Development Authority, whose powers would include the assessment of future skilled manpower needs of industry in the light of economic and technical developments. Yet a further recommendation is that the entry standards for each of the trades designated for apprenticeship be carefully reviewed from time to time and defined with a clear understanding of what will be demanded of the apprentice throughout his training. These operations will presumably entail a continuing examination of the kinds of questions raised in the preceding paragraphs.

Apprenticeship.

The common entry qualification for apprenticeship in Rhodesia is a pass in English, Arithmetic or Mathematics and one other subject at Junior Certificate level. To meet a desire on the part of Industry for a longer period of schooling than this for Africans, the Ministry of Education has in some African schools instituted a two-year post-J.C. course leading to the Cambridge School Certificate, for students looking for apprenticeships in the engineering and building trades. (11). Table V indicates that with these requirements it is unlikely that there are many African apprentices, and this is borne out by the survey. In the firms covered by the survey there were the following numbers of apprentices:—

	European	African
Mining	76	0
Manufacturing	120	6

Table VI shows the total number of apprentices in the country in 1961 and 1962:—

TABLE VI		
	31.12.61	31.12.62
Aircraft	19	21
Building	53	35
Engineering	186	198
Electrical Engineering	123	103
Hairdressing	68	140
Mining	108	102
Motor Trade	221	201
Printing	116	119
Railways	164	158
Miscellaneous	37	17
	<hr/> 1,095	<hr/> 1,094

These figures reflect the flat state of the economy at present. While this situation continues it is unlikely that there will be any significant increase in apprenticeship opening in companies. But slack economic conditions are not the only reason for the low numbers of apprenticeships. Many Rhodesian firms are too small to be able to offer training facilities and many which are able to do so do not. As far as the apprenticeship of Africans is concerned, while there is a shortage of supply of suitable qualified youths, there is also evidence of a reluctance on the part of European craftsmen to train Africans (12). Of the firms covered by the survey, six of the mines and sixteen of the industrial firms employed European apprentices, and only 2 industrial firms employed the six African apprentices. Some firms with large numbers of European apprentices had no African apprentices.

This position may be improved as a result of the recommendations of the Select Committee, that a new system of initial full-time technical training be introduced, that future responsibility for apprenticeship should lie with the proposed new Authority, and that employer organisations should be encouraged to establish group training schemes. But these will lack effectiveness to the extent that African youths fail to acquire the necessary secondary schooling.

Operative Training.

As the Judges Commission points out (13), it would be wrong to regard apprenticeship as the guide mark to be set and aimed for in industrial training, and it would also be wrong to regard the existing form of shop-based apprenticeship training as the most appropriate one. The Rhodesian situation requires a closer examination of other forms of general industrial training suited to the changing emphasis of operative work in conjunction with new machines.

In the range of general operative training at intermediate skills it is difficult from a survey of this sort to get a quantitative view of what industry is doing. The need for such training is clear. A number of firms provide some sort of on-the-job training of varying degrees of efficiency, examples of well-organised and directed training being in the motor-assembly and rubber industries. The Judges Commission makes the point that the standards of vocational training of this sort in the past have been mediocre, and quotes the view of the Fletcher Committee on Adult Education in 1959 that this is partly because of the inadequate technical training and the crude

approach to such training and to the management of men, on the part of many European supervisors. (14).

Other Vocational Training.

Technical training and the creation of an efficient industrial work force is undoubtedly of the greatest importance in this country. But awareness of this appears to bring with it a tendency to separate this problem from the one of man-power needs in general. The present apprenticeship system has for long claimed too much of the thought directed to the technical training field. The vision is now widening, but there appears to be a danger that the new awareness of the broader technical field will in national terms become itself a pre-occupation to the exclusion of problems in the other fields of employment—commercial and administrative—within Industry. In any developing country a wide competence in these fields is required to back up, and even initiate, progress in Industry.

Within both the commercial and administrative field there are needs of more than one kind. The first is in the clerical field—simple instruction in office administration, book-keeping and typing. Does Industry, as well as Government, expect to continue to recruit most of its staff at this level from among young European girls and married women, some who have obtained training in commercial colleges and the Government commercial classes, and many who have not? Shall this be a field of increasing employment for Africans? The Judges Report reveals that the minimum level of education for which employers are now tending to look among Africans for this sort of work is a Cambridge School Certificate. The small number at this level in industry at the moment is indicated in Table V. The reports suggests (15), that training at a lower level, i.e., Standard 6 and upward, might be carried out in the simpler routines by voluntary organisations, in consultation with commerce and industry. One requisite of such a scheme would be the provision of a certificate of attainment, desired by the student because it was generally recognised by employers.

It appears that there would be value in a progression of courses fitted to local conditions but somewhat on the lines of the British system, starting with the new Certificate of Office Studies and going through the Ordinary and Higher Certificates and Diplomas in Business Studies to the Diploma in Management Studies. Such courses could be taught by correspondence and through the Government commercial classes. Such a progression could carry the recognition of these Certificates and Diplomas for credits by the

professional bodies such as the Chartered Institute of Secretaries, the Institute of Costs and Works Accountants, etc., as it does in Britain. At present there are in seven of the companies which made returns a total of seventeen employees taking courses for such professional qualifications. Most other firms have their own more or less conscious training practices at the lower level.

Selection.

The concomitant of any programme of training and productive employment is the selection of workers by aptitude. The Select Committee on Apprenticeship and Technical Training has in this connection recommended the establishment by Government of a unit to be designated the Educational Measurement and Selection Unit.

Education levels in Relation to Jobs Performed.

The study itself gave no clear indication of a relationship between education and skills or job categories among existing African workers. Table VII shows the percentage of African workers in the various broad categories of work.

TABLE VII
Grading of African Employees, as Percentage of Total.

		Mining	Manufacturing Processing	Other
In unskilled jobs	....	70	87	56
In semi-skilled jobs	....	22	10	56
In skilled jobs	....	0	3	5
In staff jobs	....	8	0*	5
		<hr/> 100	<hr/> 100	<hr/> 100

* 96 in number.

In mining there is apparently a broad relationship between the percentage of unskilled and semi-skilled workers (92%) and those with an education up to Standard 3 (91.7%), and in fact the Industrial Agreement between the Chamber of Mines and the trade union, the Associated Mineworkers of Rhodesia, made in terms of the Industrial Conciliation Act, relates job categories in the skilled and semi-skilled grades to education, subject to the proviso that men in a given grade at the time of the agreement shall remain in that grade regardless of their educational level. There is no educational qualification for unskilled work, while for most of the jobs in the semi-skilled grades a Standard 6 education is required and

for jobs in the artisan or skilled mining grades two years of secondary schooling are required. There were no Africans in the artisan or skilled mining grades on the mines from which returns were received.

It is in the staff grades in the mining industry that any relationship between Tables V and VII disappears. This grade was meant to cover clerical and supervisory posts outside the structure of the Industrial agreement, for which the mining Companies normally require a Cambridge Certificate or University education. (9). Two of the mining Companies are known to employ an African in such a post, but the figure of 8% in this grade in Table VII appears to include some semi-skilled Africans in positions of gang leaders, formerly called boss boys. These jobs do not carry any educational requirement, nor the level of conditions of service and privileges which are accorded to all European workers.

The relationship between the percentages in Tables V and VII in manufacturing is even more tenuous. Here again the grades in Table VII are meant to coincide with those in the Industrial Agreements in the main industries, and the staff positions outside the terms of the Agreements. In fact such Agreements do not exist in some industries, while in those where they do exist the grading of various types of work into the skills and the staff category do not coincide nor are they related to education. Since each Industrial Agreement in Southern Rhodesia applies to a single industry, which in some cases comprises a single firm, job categories can vary between firms. Table VII should, therefore, be taken as only a broad indication of the percentages of workers in various job categories.

Higher Education and Management Training.

There are indications of a growing demand among the larger firms for Africans at higher education levels for management jobs. Subsequent training for these men and for European management trainees, is obtained in a number of ways—by internal Company training schemes, by sending the trainees overseas to parent Companies or to other outside management courses, and by sending them to local courses run by the Rhodesian Institute of Management. One example of the internal Company scheme is the Caltex Training School, where the firm takes groups of potential African staff employees and instructs them in Company matters, office management, marketing, etc., for six months, with a further six

months' on-the-job training before they go into the field. All these ways may be possible to the few large firms in the country, and relevant to the scope and size of these firms, but as Table II shows, the average size of firm in Southern Rhodesia is small, employing less than 100 workers.

Mr. Guy Hunter (16), has suggested that the training of managers in small businesses should not arrogate to itself the title of 'Management Education' or 'Management Training' since these terms cause confusion, and cause disappointment to students who, having acquired some level of attainment in subjects such as Basic Management, Communication, and Principles of Management, then consider themselves trained as managers. He suggests that training in management on the scale usual in Tropical Africa should be described simply as Industrial and Commercial Courses. This comment is only partly valid for Southern Rhodesia, where alongside the very small businesses, many of the owners and managers of which need courses in basic commercial practice and office management, there is a range of larger industrial firms whose managers need more sophisticated management training (as well, in many cases, as the basic techniques referred to above).

So here again there appear to be a number of kinds of need: first, training at the supervisory level of management to overcome the kind of deficiency in European supervisors that has been referred to earlier, and the lack of experience of African supervisors; second, education for an understanding of the basic tools of management, such as costing, office management, marketing, work-study, etc., for owners and managers of small businesses and junior managers of larger businesses; third, education for a wider understanding of the basic economic and social conditions in which the firm operates, and the way these are changing with changing human relations in Rhodesia, for higher management in larger businesses. Education in industrial relations, particularly in a country like Southern Rhodesia, appears to be required at all levels.

The questions that arise here are: how far are short courses on broad subjects like Basic Management Principles, and Communications as used in other countries relevant to management in Southern Rhodesia? How useful are such courses in any circumstances? Is management and its function in the economy important to the progress of the economy, and if so what sort of comprehensive and continuing programme of business training and management development is required, and who is to be responsible for it?

Informal Education.

Sir Peter Venables' reference to firms as social organisations, quoted earlier, indicates a broader virtue of the firm in regard to its employees and to the community—that is, as a centre in which men have access to less formal educational influences, through the provision of study rooms and welfare facilities. This virtue is already displayed in the centres established by mining companies and some of the large estate enterprises. One of the latter companies introduced in 1963 a conscious programme of civic activities using its welfare hall as the focus. This type of informal education can include the establishment of library facilities, film shows, talks and discussions and drama groups, on club lines, and in fact on most mines and estate enterprises, and in a number of urban companies, such club facilities already exist for European employees. Experience has shown that the establishment of such facilities, notwithstanding the existence of the other facilities of an urban community, can have a good effect on the morale and efficiency of the workers in the firm.

(6) P. F. R. Venables, "Technical Education" (G. Bell and Sons, 1955) Page 173.

(7) Venables op. cit. Page 181.

(8) Report of the Southern Rhodesia Education Commission, 1963. (Judges Commission), Page 59.

(9) Judges Commission Report, Page 59.

(10) Judge Commission Report, Page 14.

(11) Judges Commission Report, Page 83.

(12) See Rhodesia Herald 31.1.64 on the attitude of Amalgamated Engineering Union to training African apprentices on the Railways.

(13) Judges Commission Report, Page 11 et seq.

(14) Judges Commission Report, Page 100.

(15) Judges Commission Report, Page 104.

(16) Guy Hunter, Tropical Africa Project, Supplement on Manpower and Training. Institute of Race Relations, Page 31.

CONCLUSION.

This disposition of the facts obtained in the survey, and the commentary upon them, suggest a reformulation of the questions with regard to which the study has sought clarification and tentative answers. The questions can now be posed as follows:

1. How far is there a lack of workers in industry with adequate education?

2. How appropriate to the needs of African adults, including those in industrial employment, are the available educational syllabuses and teaching materials?

3. How appropriate to the present needs of industry is the education provided, (a) by the school system, and (b) within industry itself?

4. Is it necessary to re-examine the relationship between a man's level of education and his capacity to be trained for, and to perform jobs at, various levels of skill.

5. How far is there a lack of workers with adequate occupational training?

6. How appropriate to economic needs is the occupational training which is provided?

In this concluding summary we refer these questions to those parts of the text where they are dealt with more extensively, and we draw attention to the problem of the responsibility for providing answers to the questions and for improving the existing position.

With regard to the first question, the chapter on Education Among African Workers indicates a lack of such workers in industry at the levels of functional literacy; at lower secondary school level, at which is now found the potential supervisor, foreman, artisan and clerk; at upper secondary school level, at which is now found the potential technician and junior manager; and at University level, at which is found the potential executive and senior manager. Regarding the responsibility for improving the present facilities, the indications are that some employers are themselves accepting this responsibility to a limited extent at the two lower levels, i.e., functional literacy and the lower secondary level. Some companies conduct a form of block release educational scheme for picked workers, and/or night schools, and some provide assistance to workers studying by correspondence. The indications are that this kind of assistance is likely to be limited to the larger companies, and that even for these companies, and certainly for the many smaller ones, assistance is needed from other agencies such as

correspondence schools, and through evening classes run by technical colleges, local authorities and voluntary associations.

There appears to be a need to co-ordinate the efforts of all these agencies and of the companies in a national programme of adult education at these lower levels, to remedy the lack of formal education in the school system. One of the main proposals made at a National Conference on Adult Education in Salisbury in November, 1964, was for the establishment of a National Council for Adult Education, with Regional Committees, and the answer to this question will be one of the main concerns of this new national organisation. Another contribution which the national organisation may be expected to make is in investigating the use of aids in adult education. At the same time, the main responsibility for providing school leavers with the minimum educational requirements of industry will rest with the Government school system.

At the higher levels, i.e. upper secondary and University level, this new organisation should also be able to make some contribution towards helping persons already in employment, but the main responsibility for making up the deficiencies at these levels is likely to rest with the Government secondary school system and the Universities.

With regard to the second question, about syllabuses and teaching materials for African adults, the section on Literacy and The Lower Primary School Level in the chapter on Education Related to Vocational Training indicates that existing syllabuses and literatures prepared for schools are not suitable for adults. There is a need for further investigation into the preparation and introduction of such materials, and of teaching methods, appropriate to African adults. This would appear to be a proper responsibility of the Institute of Adult Education of the University College, working in conjunction with the National Council for Adult Education.

The third and fourth questions, concerning the appropriateness of the education, and the relationship between educational levels and the capacity for being trained and performing various jobs, are themselves closely related. They are dealt with in the chapter on Education Related to Vocational Training. The answering of these questions will require a manpower development plan and a development Authority along the lines recommended by the Select Committee on Apprenticeship and Technical Training. These will, however, themselves require supporting research, relating to other occupations as well as to craft and technical work, and the question arises as to what contribution the University College in Salisbury

could make in this field through its Faculty of Education and with the co-operation of Industry. Examples of the contribution of Universities in this field are provided by the work of the Division of Vocational Education at the University of California, Los Angeles, and the Division of Industrial and Vocational Education in the Faculty of Education, University of Alberta, Canada. (17).

The fifth and sixth questions are discussed more fully in the sections on technical and other vocational training in the chapter on Education Related to Vocational Training. The answers to these questions should also fall within the scope of the manpower development plan envisaged by the Select Committee. They would, however, appear to go beyond the scope of the new Authority recommended by the Select Committee, in that the proposals for this Authority appear to be restricted to apprenticeship and other technical work. The question arises as to whether it is not necessary to consider the establishment of an Authority with a wider scope and representation, on the lines of the Central Training Council being established under the new Industrial Training Act in Great Britain, whose proposed scope includes clerical, commercial and other service occupations. (18).

(17) The Division of Vocational Education at the UCLA has for many years worked in co-operation with the vocational services of the California State Department of Education and with many industrial concerns in California, on studies concerned with programmes in vocational (and particularly technical) education in the schools and junior colleges of California. These studies involve research into critical elements of the technical education curriculum, with the view to keeping the curriculum up to date with the requirements of industry. The Division of Industrial and Vocational High Schools in Alberta. This teaching is related to the new pro-and Vocational Education at the University of Alberta is primarily concerned with the preparation of teachers in vocational and technical subjects at High Schools duction techniques being developed in industry. The Department operates a teaching laboratory/workshop at the North Alberta Institute of Technology. Its work is an important element in the implementation of the Technical and Vocational Training Assistance Act of Canada, in terms of which the Federal Government provides financial assistance to Provincial Governments for vocational and technical training projects.

(18) U.K. Ministry of Labour General Guide to the Industrial Training Act, April, 1964.

APPENDIX.

Note on the Education System in Southern Rhodesia.

During the federation of the two Rhodesias and Nyasaland education for Europeans and Africans was the responsibility of the different Governments, European education at school level being a Federal responsibility and African education at that level a Territorial responsibility. With the end of the Federation the Southern Rhodesia Government has brought both under one Ministry but the two systems remain separate and independent. Apart from private schools, which have been permitted to accept children of any race if they wish (and some of which have done so) schooling is still segregated. There are separate schools for Asians and Coloureds.

Within the African education system there are Government schools and schools run by voluntary agencies—mainly the missions. In the latter the Government accepts responsibility for meeting teachers' salaries.

European schools are divided into Primary Schools (Sub-A to Standard 5) and Senior Schools (Form I to Form VI). African schools are divided into Lower Primary Schools (Sub-A and Sub-B to Standard III), Upper Primary Schools (Standards IV to VI) and Secondary Schools (Form I to Form VI). There are only two African Secondary Schools which go beyond Form IV.

The enrolments in the two school systems in 1963 were as follows:

			African	European	Asian and Coloured
Sub-A	....	....	123,719	5,032	880
Sub-B	....	....	113,518	4,658	815
Standard 1	....	....	102,051	4,554	744
Standard 2	....	....	85,434	4,588	807
Standard 3	....	....	81,065	4,697	705
Standard 4	....	....	35,827	4,655	691
Standard 5	....	....	27,219	4,475	706
Standard 6	....	....	21,962	—	—
Total Primary:			590,795	32,659	5,348
Form I	....	....	3,407	4,378	620
Form II (J.C.)	....	....	2,447	4,481	582
Form III	....	....	724	4,435	476
Form IV (Cambridge)	386	3,922)	382
Form V	45	1,074	
Form VI	36	1,608	36
			7,045	19,898	2,116



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